

1-14. (CANCELED)

15. (CURRENTLY AMENDED) A flexible dental instrument for use in drilling a root canal, and the dental instrument being designed to be mechanically driven by an electric motor, the dental instrument (10) being flexible and comprising:

an end section (11) for mounting in a chuck driven by said electric motor,

a proximal region (14) adjacent to said end section (11),

a central region (13) extending from said proximal region, and

a distal region (12) extending from said central region (13) for guiding the instrument through the root canal, and

an envelope (20) comprising the proximal region, the central region and the distal region and the envelope defining an axial length and having a generally inverted cone shape, with a widest portion of the envelope (20) corresponding to the distal region (12) and a smallest portion of the envelope (20) corresponding to the proximal region (14),

wherein the dental instrument further comprises a junction region (17), located between the proximal region (14) and the end section (11), and the junction region (17) comprises an area of the envelope (20) having a minimum thickness which is designed to break in the event that a predetermined drive torque is applied to the envelope (20) during use of the dental instrument, and a leading end of the

end section (11) tapers toward and joins with the junction region (17), and a

~~combined axial length of the distal region (12), the central region (13) and the~~

~~proximal region (14) is longer than an axial length of the end section (11)~~

the central region (13) is polygonal and comprises hollowed flutes (16)

with sharp cutting edges that are generally helical.

✓

✓

✓

✓

✓

16. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein the envelope (20) has a truncated cone shape and comprises a vortex angle ( $\Phi$ ) that is identical along its entire length.

17. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein the envelope (20) consists of several juxtaposed sections (C, D, E, F) extending axially from one another, each of said sections having a truncated cone shape and each of said truncated cones comprising a different vortex angle ( $\Phi_1$ ,  $\Phi_2$ ,  $\Phi_3$ , and  $\Phi_4$ ), with a widest vortex angle ( $\Phi_1$ ) corresponding to the distal region (12), a smallest vortex angle ( $\Phi_4$ ) corresponding to the proximal region (14), and at least one intermediate vortex angles ( $\Phi_2$ ,  $\Phi_3$ ) corresponding to the central region (13).

18. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein an angle of the envelope (20) relative to an axis of the dental instrument decreases progressively and regularly from the distal region (12) to the proximal region (14).

19. (CANCELED)

20. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein the area of the envelope (20) which is designed to break consists of a reduced section adjacent the proximal region (14) of the envelope (20).

21. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein the area of the envelope (20) which is designed to break consists of a modification in one or more of type and structure of material used for the dental instrument.

22. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein the area of the envelope (20) which is designed to break consists of at least one peripheral notch (18) formed in said junction region (17).

23. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein the predetermined drive torque corresponds to a torque at which the distal region of the dental instrument breaks.

24. (PREVIOUSLY PRESENTED) The dental instrument according to claim 15, wherein the distal region (12) comprises a rounded tip.

25. (CANCELED)

26. (CURRENTLY AMENDED) ~~The dental instrument according to claim 15,~~  
~~wherein~~ A flexible dental instrument for use in drilling a root canal, and the dental  
instrument being designed to be mechanically driven by an electric motor, the dental  
instrument (10) being flexible and comprising:

an end section (11) for mounting in a chuck driven by said electric  
motor,

a proximal region (14) adjacent to said end section (11),

a central region (13) extending from said proximal region, and

a distal region (12) extending from said central region (13) for guiding  
the instrument through the root canal, and

an envelope (20) comprising the proximal region, the central region  
and the distal region and the envelope defining an axial length and having a  
generally inverted cone shape, with a widest portion of the envelope (20)  
corresponding to the distal region (12) and a smallest portion of the envelope (20)  
corresponding to the proximal region (14),

wherein the dental instrument further comprises a junction region (17),  
located between the proximal region (14) and the end section (11), and the junction  
region (17) comprises an area of the envelope (20) having a minimum thickness  
which is designed to break in the event that a predetermined drive torque is applied  
to the envelope (20) during use of the dental instrument, and a leading end of the  
end section (11) tapers toward and joins with the junction region (17), and

the central region (13) is polygonal and comprises flutes (16) with blunt edges that are generally helical.

27. (CANCELED)

28. (CURRENTLY AMENDED) ~~The dental instrument according to claim 15,~~ ✓  
~~wherein~~ A flexible dental instrument for use in drilling a root canal, and the dental ✓  
instrument being designed to be mechanically driven by an electric motor, the dental ✓  
instrument (10) being flexible and comprising: ✓  
an end section (11) for mounting in a chuck driven by said electric ✓  
motor, ✓  
a proximal region (14) adjacent to said end section (11), ✓  
a central region (13) extending from said proximal region, and ✓  
a distal region (12) extending from said central region (13) for guiding ✓  
the instrument through the root canal, and ✓  
an envelope (20) comprising the proximal region, the central region ✓  
and the distal region and the envelope defining an axial length and having a ✓  
generally inverted cone shape, with a widest portion of the envelope (20) ✓  
corresponding to the distal region (12) and a smallest portion of the envelope (20) ✓  
corresponding to the proximal region (14), ✓  
wherein the dental instrument further comprises a junction region (17), ✓  
located between the proximal region (14) and the end section (11), and the junction ✓  
region (17) comprises an area of the envelope (20) having a minimum thickness ✓  
which is designed to break in the event that a predetermined drive torque is applied ✓  
to the envelope (20) during use of the dental instrument, and a leading end of the ✓  
end section (11) tapers toward and joins with the junction region (17), and ✓  
the central region (13) comprises helical sections (16a) and rectilinear sections (16b).

29. (CURRENTLY AMENDED) A flexible dental instrument for drilling a root canal, the dental instrument being manufactured from titanium-nickel and being flexible and designed to be mechanically driven by an electric motor, the flexible dental instrument (10) comprising:

a end section (11) for mounting in a chuck of an electric motor;

a proximal region (14) adjacent to the end section (11);

a central region (13) extending from the proximal region; and

a distal region (12) extending from the central region (13) for guiding the dental instrument through the root canal, and the distal region (12) terminating in a rounded tip;

an envelope (20) comprising only the proximal region, the central region and the distal region and the envelope (20) defining an axial length and having a generally inverted cone shape with a widest portion of the envelope (20) corresponding to the distal region (12) and a narrowest portion corresponding to the proximal region (14);

wherein the dental instrument further comprises a junction region (17), located between the proximal region (14) and the end section (11), and the junction region (17) comprises an area, with a minimum thickness, which is designed to break when a predetermined drive torque is applied to the envelope (20), and a leading end of the end section (11) tapers toward and joins with the junction region (17) ✓  
~~and a combined axial length of the distal region (12), the central region (13) and~~ ✓  
~~the proximal region (14) is longer than an axial length of the end section (11),~~ ✓  
~~including the leading end thereof; and~~

the distal region (12), the central region (13) and the proximal region (14) have a polygonal cross section and comprise a plurality of hollow flutes with helical cutting edges.

30. (CURRENTLY AMENDED) A flexible root canal dental instrument for drilling a root canal, the dental instrument being manufactured from titanium-nickel and being flexible and designed to be mechanically driven by an electric motor, the flexible dental instrument (10) comprising:

a cylindrical end section (11) for mounting in a chuck of an electric motor;

a proximal region (14) adjacent to the end section (11);

a central region (13) extending from the proximal region; and

a distal region (12) extending from the central region (13) for guiding the dental instrument through the root canal, and the distal region (12) terminating in a rounded tip which, during use, guides the dental instrument and minimizes the possibility of the dental instrument becoming embedded in a canal wall of a tooth;

an envelope (20) comprising the proximal region, the central region and the distal region and the envelope (20) defining an axial length and having a generally inverted cone shape with a widest portion of the envelope (20) corresponding to the distal region (12) and a smallest portion corresponding to the proximal region (14);

wherein the dental instrument further comprises a junction region (17), located between the proximal region (14) and the end section (11), and the junction region (17) comprises an area, with a minimum thickness, which is designed to break when a predetermined drive torque is applied to the envelope (20) and a vertex angle is constant along the entire axial length of the envelope (20), and a leading end of the end section (11) tapers toward and joins with the junction region (17) and a combined axial length of the distal region (12), the central region (13) and the proximal region (14) is longer than an axial length of the end section (11); and

✓

✓



the distal region (12), the central region (13) and the proximal region (14) have a polygonal cross section and comprise a plurality of hollow flutes with helical cutting edges.

31. (CANCELED)

32. (PREVIOUSLY PRESENTED) The dental instrument according to claim 29, wherein the area which is designed to break comprises one of:

a reduced section adjacent the proximal region (14) of the envelope (20);

a modification in one or more of type and structure of material used for the dental instrument; and

at least one peripheral notch (18) formed in the junction region (17).

33. (PREVIOUSLY PRESENTED) The dental instrument according to claim 30, wherein the area which is designed to break comprises one of:

a reduced section adjacent the proximal region (14) of the envelope (20);

a modification in one or more of type and structure of material used for the dental instrument; and

at least one peripheral notch (18) formed in the junction region (17).